

REMARKS

In the Office Action, the Examiner indicated that claims 1 through 37 are pending in the application and the Examiner rejected all claims.

Objections for the Specification

On page 2 of the Office Action, the Examiner objected to the specification because the output differential signal pair 21 in the specification is not correlated with the output differential signal pair in Figure 1. Applicants have amended the specification to correct this informality.

Claim Rejections, 35 U.S.C. §102

On page 3 of the Office Action, the Examiner rejected claims 1-6, 9-12, 14-23, 25-28, 30, and 33-37 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Publication No. 2001/0036261 to Prendergast ("Prendergast").

The Present Invention

This invention improves the attenuation of an undesired signal found in a differential signal path by using inductive, as opposed to capacitive, coupling. The inventive electrical interface includes a primary inductor, a secondary inductor, and a filter. The primary inductor and the secondary inductor operably couple an input differential signal pair to an output differential signal pair, and the filter attenuates an undesired signal in the output differential

signal pair. The input differential pair is formed by using a differential driver, e.g., a CODEC, to generate the pair from a single input line (e.g., a tip line).

Other aspects of the invention provide for an input attenuation element coupled to one of the signal paths forming the input differential signal pair. The input attenuation element can act as a high-pass filter. Further features of the invention can also provide for a low-pass filter that attenuates an undesired signal in the output differential signal pair. Additional aspects of the invention also provide for a high-pass filter and a low-pass filter having overlapping cut-off frequencies that thereby provide for improved noise immunity.

Another aspect of the invention includes a parasitic capacitor operably coupled between the primary and the secondary inductor. The parasitic capacitor has a capacitance in the range of approximately 0.5 pF to approximately 2.5 pF.

The invention also includes a method for interfacing an input differential signal pair to an output differential signal pair. In particular, the method includes the steps of inductively coupling the input differential signal pair to an output differential signal pair, and filtering out a common mode signal occurring in the output differential signal pair. The inventive method improves the attenuation of an undesired signal found in a differential signal path by using inductive coupling.

U.S. Patent Publication No. 2001/0036261 to Prendergast

U.S. Patent Publication No. 2001/0036261 to Prendergast ("Prendergast") teaches a termination impedance circuit coupled to a communication link. The termination impedance

circuit provides the ability to select the impedance. A second device comprises an echo-cancel hybrid circuit, coupled to a communication link, that provides an echo-cancel characteristic, wherein the characteristic is also selectable. Figure 3 of Prendergast, relied upon by the Examiner, teaches the use of an isolation transformer 110 across a single input line (a tip line) and a single output line (a ring line).

U.S. Patent No. 6,385,315 to Viadella et al.

U.S. Patent No. 6,385,315 to Viadella et al. ("Viadella") teaches an arrangement of plural filter circuits on a single card, an interconnection end mounting of numerous cards on a single rack to facilitate maintenance. The Examiner relies upon Viadella for an alleged teaching of the coupling of a parasitic capacitor between the primary inductor and secondary inductor of an isolation transformer.

U.S. Patent No. 5,832,076 to Holthaus et al.

U.S. Patent No. 5,832,076 to Holthaus et al. ("Holthaus") teaches an apparatus and method for determining the presence and polarity of DC bias voltage at a telephone microphone. The Examiner relies upon Holthaus for an alleged teaching of an interface having an input attenuation element that includes a resistor and capacitor connected in series.

The Cited Prior Art Does Not Anticipate the Claimed Invention

The MPEP and case law provide the following definition of anticipation for the purposes of 35 U.S.C. §102:

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” MPEP §2131 citing *Verdegaal Bros. v. Union Oil Company of California*, 814 F.2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987)

The Examiner Has Not Established a *prima facie* Case of Anticipation

As noted above, the present claimed invention includes a primary inductor and secondary inductor for operably coupling an input differential signal pair, formed by a differential driver means, such as a CODEC, that generates two signal paths that together form the input differential signal pair, to an output differential signal pair, and a filter that attenuates a signal occurring in the output differential signal pair. Configured in this manner, common mode signals across the differential signal path (in the example, across the tip line of a POTS system) are attenuated.

Prendergast contains no such teaching and no such functionality. As noted above, Prendergast simply teaches the prior art method of providing high voltage isolation and improving noise immunity to common mode signals in a telephone circuit. However, the claimed invention provides substantially improved rejection of high voltage (e.g., 20 volts peak-to-peak) common mode signals, an improvement not taught or suggested by Prendergast, and not achievable by Prendergast. Thus, for example, common mode noise signals injected onto communication equipment from, for example, AM radio signals and from electrical

devices that do not comply with Part 15 of the FCC requirements, are filtered out by the present invention, and are not filtered out by Prendergast.

Each of the independent claims, as amended, specifically recite the differential driver, such as a CODEC, to generate two signal paths from a single input line data signal, these two signal paths together forming the input differential signal pair. Since Prendergast neither teaches nor suggests this claimed element, among others, the claimed invention patentably defines over Prendergast. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1-6, 9-12, 14-23, 25-28, 30, and 33-37 based on Prendergast.

Rejections under 35 U.S.C. §103(a)

On page 7 of the Office Action, the Examiner rejected claims 7, 8, 24, and 31-32 under 35 U.S.C. §103(a) as being unpatentable over Prendergast in view of U.S. Patent No. 6,385,315 to Viadella et al., and on page 8 of the Office Action, the Examiner rejected claims 13 and 29 under 35 U.S.C. §103(a) as being unpatentable over Prendergast in view of U.S. Patent No. 5,832,076 to Holthaus et al.

The addition of either Viadella or Holthaus, alone or combined, do not teach or suggest the division of a single input line to form a differential pair, and then the operative coupling of an output differential signal pair, via a primary inductor and a secondary inductor, to the input differential signal pair so formed, along with a filter that attenuates a signal occurring in the output differential signal pair. As noted above, each of the independent claims include these claimed elements, and thus they are included in the dependent claims rejected under 35 U.S.C.

§103, as well. Each of the dependent claims include additional imitations which, taken with the independent claims, recite additional novel and/or non-obvious aspects of the present invention. Accordingly, the rejection of claims 7, 8, 13, 24, 29, and 31-32 under 35 U.S.C. §103 based upon either Viadella or Holthaus are inappropriate, and the Examiner is respectfully requested to reconsider and withdraw these rejections.

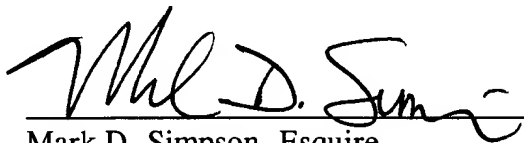
Conclusion

The present invention is not taught or suggested by the prior art. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection of the claims. An early Notice of Allowance is earnestly solicited.

Enclosed herewith, in duplicate, is a Petition for extension of time to respond to the Examiner's Action, and a Credit Card Payment Form authorizing the payment of the extension fee. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment associated with this communication to Deposit Account No. 19-5425.

Respectfully submitted

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Date


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